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MOTION IN PLANTS.

WE are apt to consider motion as an attribute of animals alone, and as one of the distinctive features by which the Animal is distinguished from the Vegetable Kingdom. Closer acquaintance with nature, especially with the minuter forms of life, weakens, if it does not dispel our faith in spontaneous action as a characteristic of either great division of living things, independent of the other. Motion seems to be a quality inherent in life whether in animals or plants; its presence or absence does not serve to mark the dividing line. It seems to be in the lowest orders that the two kingdoms most nearly approach. For a long time naturalists were uncertain as to the true position of the diatoms, those little microscopic forms which in some places constitute such large deposits, that the city of Richmond is said to be actually built over a vast cemetery of their remains. In their silicious shields, the scoring and ornamentation of which are the wonder of the observer, and in their free motions, they seemed to be animals, and even the great Ehrenbergh so classified them. Later testimony seems to indicate that they are essentially plants.

AMERICAN FARM SCENE.—PETER MORAN.

In the algæ, or sea-weeds, a curious motion of the spores is noticeable. They move about freely in the water until their time of germination, by means of vibratile cilia, resembling those with which many animals are provided. The motion is checked by anæsthetic agents, such as chloroform and ether, when the cilia that give rise to the phenomenon may be observed. They are similar in appearance and function to the hair-like processes that make the so-called wheel of the rotifers.

> "It was a pleasant thought to mark the hours,
> As they floated in light away,
> By the opening and the folding flowers,
> That laugh to the summer day."

If we observe the flowers in our gardens at different times, we will find them open and close at varying periods. The morning-glory unrolls its purple tent at early dawn; the mirabilis, or marvel of Peru, flowers about four o'clock in the afternoon and from this fact derives its more familiar name; the evening primrose waits for the darkness; and the lovely cereus blooms in the night when only the devotee can view the mystery of its nuptials, or breathe its intermittent puffs of perfume. By a judicious selection of flowers we can thus chronicle the passing days, as Mrs. Hemans sings, in the lines above quoted, and form a floral dial as we have a monthly calendar.

Every one must have noticed the action of the stamens in the barberry when touched near the base. With a sudden jerk they approach the pistil and discharge the pollen. The motion of the stamens in the mountain laurel, or kalmia, is different and purely mechanical. In this case the anthers are held in little depressions of the corolla, which give the latter its pretty scalloped appearance. The stamens are so bent as to form tense springs. When dislodged, they fly back like little pop-guns, throwing their pollen upon the disturbing insect, or upon some neighboring flower of the same plant, and probably by design overshooting their own stigma.

The Venus's Fly Trap of North Carolina is famous for its singular action. It belongs to the Sundew Family, all of which evince a greater or less tendency to similar movement. In the Dionæa, when the spreading blade of the leaf is touched by some adventurous insect, the sides, which have three sensitive hairs upon their inner exposure, and fringes on the edge, close upon him, and imprison him forever. His struggles only serve to hold him the faster, and it is only when he is dead that the fatal trap relaxes its hold. Recent investigations seem to indicate that the plants of this family are carnivorous. It is found that when they are fed with meat, the traps instantly inclose the morsel—that a sort of gastric juice is developed, and that after a time the meat will be found to have been digested, the fibre only remaining behind. The leaves will accept carbonate of ammonia—but remain inactive with chalk or any substance not fit for assimilation.

A remarkable automatic action is observable in the *Desmodium gyrans* of the East Indies. It belongs to a genus quite common with us, and a Southern member of which has been said to have the same habit. It has three leaflets on a stalk—the terminal one quite large, and the two lateral small. The motion in the larger one is not often visible, except as regards its change from a diurnal to a nocturnal position; "but the lateral ones are continually rising and falling, both day and night, by a succession of little jerks, like the second-hand of a time-keeper; the one rising while the other falls. Exposure to cold, or cold water poured upon the plant, stops the motion, which is immediately renewed by warmth." Several orchideous plants exhibit similar action in their "lips"—the portion which in our familiar arethusa is so beautifully fringed and colored.

Motion is often imparted by the hygrometric condition of a plant—as in the so-called resurrection-plants, brought from the arid deserts of the West. As we first see them they look like balls of dry lichen, but when wet at once expand into living plants. The pollen-masses of certain orchids, as shown by Darwin, exhibit a movement to be referred to hygrometric action, and which admirably accomplishes the object aimed at by the plant, in so fixing the pollen upon the head of an insect that, in his visit to another flower, it will unavoidably be deposited upon the viscid surface of the stigma.

As regards the causes of the phenomena we have been considering, various theories have been propounded, and elaborate experiments entered into to prove the positions of the disputants. Some of the movements we have seen to be purely mechanical, others to be caused by the absorption of water, and others that are so like the sentient action of animals that we are forced to a belief in the vital power of plants, only differing in degree from that which characterizes the animal world. — *W. W. Bailey.*